

WHAT IS CLAIMED IS:

1. An input device comprising:
  - magnets that are arranged in a flat state;
  - 5     coils that are arranged so as to face the magnets,  
and are moved in relation to the magnets;
  - a mobile member that is connected to the coils;
  - a first guide member that slidably guides the  
mobile member;
  - 10     a second guide member that slidably guides the  
first guide member in a direction perpendicular to the  
sliding direction of the mobile member; and
  - a switch that is operated by an operator to carry  
out an input operation,
  - 15     the switch being formed on the mobile member.
  
2. An input device comprising:
  - coils that are arranged in a flat state;
  - magnets that are arranged so as to face the coils,
  - 20     and are moved in relation to the coils;
  - a mobile member that is connected to the magnets;
  - a first guide member that slidably guides the  
mobile member;
  - a second guide member that slidably guides the  
25     first guide member in a direction perpendicular to the  
sliding direction of the mobile member; and
  - a switch that is operated by an operator to carry  
out an input operation,
  - 30     the switch being formed on the mobile member.
  
3. An input device comprising:
  - magnets that are arranged in a flat state;
  - coils that are arranged so as to face the magnets,
  - and are moved in relation to the magnets;
  - 35     a mobile member that is connected to the coils;
  - a first holding member that slidably holds the  
mobile member;

a second holding member that slidably holds the first guide member in a direction perpendicular to the sliding direction of the mobile member; and

a switch that is operated by an operator to carry  
5 out an input operation,  
the switch being formed on the mobile member.

4. An input device comprising:  
coils that are arranged in a flat state;  
10 magnets that are arranged so as to face the coils,  
and are moved in relation to the coils;  
a mobile member that is connected to the magnets;  
a first holding member that slidably holds the mobile member;  
15 a second holding member that slidably holds the first guide member in a direction perpendicular to the sliding direction of the mobile member; and  
a switch that is operated by an operator to carry out an input operation,  
20 the switch being formed on the mobile member.

5. The input device as claimed in claim 1, further comprising  
a controlling unit that performs control so as to  
25 allow control current to flow into the coils when the switch is on.

6. The input device as claimed in claim 1, further comprising  
30 a controlling unit that performs control so as to prohibit control current from flowing into the coils when the switch is on.

7. The input device as claimed in claim 1,  
35 wherein:  
the switch includes a button switch that is linked to the mobile member; and

when the mobile member is pressed, the switch is turned on or off.

8. The input device as claimed in claim 1,  
5 further comprising  
a pressing member that is slidably located inside the mobile member and protrudes from the upper surface of the mobile member,  
wherein:  
10 the switch includes a button switch below the pressing member; and  
when the pressing member is pressed, the switch is turned on or off.

15 9. The input device as claimed in claim 1, wherein the switch includes a photointerrupter.

10. The input device as claimed in claim 1, wherein the switch includes a button switch and a  
20 photointerrupter, the button switch being linked to the lower part of the mobile member or being slidably provided inside the mobile member and protruding from the upper surface of the mobile member.

25 11. The input device as claimed in claim 9, wherein the photointerrupter is provided inside the mobile member so that a detection surface is exposed through the mobile member.

30 12. The input device as claimed in claim 9, further comprising  
an optical waveguide pipe that has one surface exposed through the mobile member and the other surface optically linked to a detection surface of the  
35 photointerrupter,  
wherein the photointerrupter is located inside the mobile member.

13. The input device as claimed in claim 1,  
wherein:

5 the mobile member includes a mobile piece that  
protrudes so that an operator can touch the mobile  
member;

10 the mobile piece includes an engaging tongue that  
engages with the first guide member so as to prevent  
the first guide member from slipping off.

14. The input device as claimed in claim 1,  
wherein at least one of the first guide member and the  
second guide member includes a protrusion on a sliding  
face.

15 15. The input device as claimed in claim 14,  
wherein the protrusion is a rail-like protrusion  
extending in a sliding direction.

20 16. The input device as claimed in claim 14,  
wherein the protrusion includes hemispherical  
protrusions scattered on the sliding face.

25 17. The input device as claimed in claim 1,  
wherein at least one of the first guide member and the  
second guide member includes a plurality of convex  
parts on a sliding face.

30 18. The input device as claimed in claim 3,  
wherein the second holding member includes a pair of  
shafts that are arranged at a distance from each other  
and support the first holding member in a slidable  
state.

35 19. The input device as claimed in claim 1,  
wherein the mobile member includes a shock relief  
member that eases shock when the mobile member reaches

the furthest end reachable.

20. The input device as claimed in claim 19,  
wherein the shock relief member includes at least one  
5 of a plate spring, a coil spring, or a shock absorber.

21. The input device as claimed in claim 1,  
wherein the magnets are integrally formed with spacers  
by molding a magnetic material.  
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22. The input device as claimed in claim 1,  
further comprising  
a substrate to which the coils are secured,  
wherein the substrate is secured by an engaging  
15 claw provided to the mobile member.

23. The input device as claimed in claim 22,  
wherein the substrate is integrally formed with the  
mobile member.  
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24. The input device as claimed in claim 1,  
further comprising  
a resin substrate to which the coils are secured,  
wherein the substrate has ribs for positioning  
25 and securing the coils.

25. The input device as claimed in claim 13,  
further comprising  
a stand-by mechanism that secures the mobile  
30 piece to a predetermined position.

26. The input device as claimed in claim 1, the  
coils are covered with a black color agent.

27. The input device as claimed in claim 1,  
wherein surfaces of the magnets are subjected to  
blackening.  
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28. The input device as claimed in claim 1,  
wherein epoxy resin containing a black color agent is  
applied to surfaces of the magnets.

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29. The input device as claimed in claim 1,  
further comprising

a magneto-electric conversion element that  
detects movement of the coils in relation to the  
magnets.

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30. The input device as claimed in claim 1,  
wherein the magnets are permanent magnets or  
electromagnets.

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31. The input device as claimed in claim 1,  
further comprising:

a first substrate on which a driving unit for  
driving an actuator unit including the coils and the  
magnets is formed; and

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a second substrate on which a controlling unit  
for controlling the driving unit is formed,

the first substrate and the second substrate  
being electrically connected to each other with a  
curled cable.

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